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**TITLE:****HV365WX2-200 Preliminary Product Specification**

BEIJING BOE DISPLAY TECHNOLOGY

SPEC. NUMBER  
S8-65-8A-014

PRODUCT GROUP  
TFT LCD

REV.  
P0.2

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A4(210 X 297)

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|                                                                                              | TFT LCD                                                        | P0.2 | 2012.05.10      |
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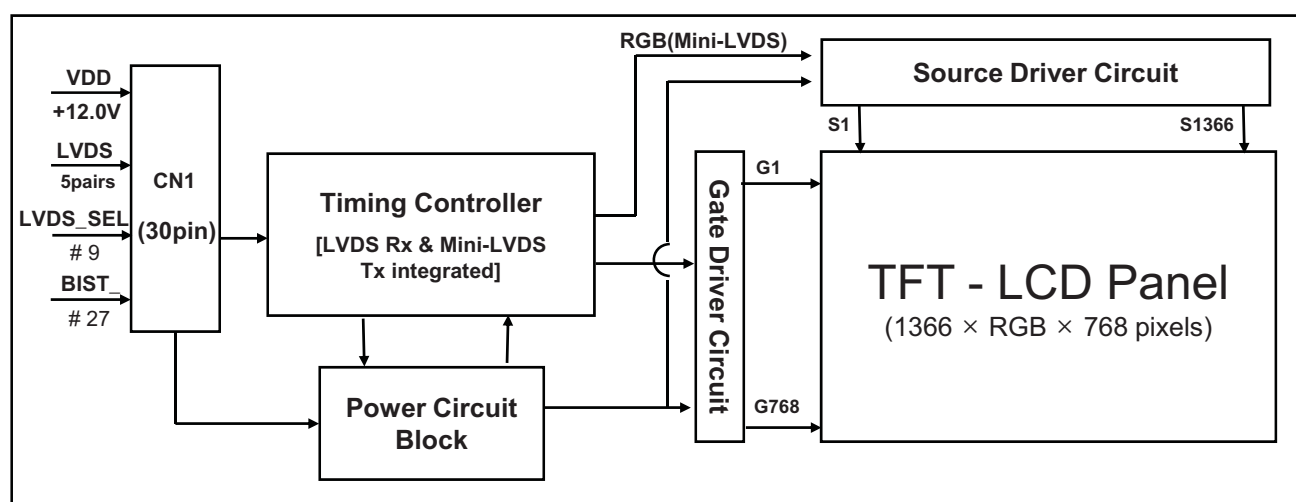
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## 1.0 GENERAL DESCRIPTION

### 1.1 Introduction

HV365WX2-200 is a color active matrix TFT LCD open cell using amorphous silicon TFT's (Thin Film Transistors) as an active switching devices. This open cell has a 36.50 inch diagonally measured active area with WXGA resolutions (1366 horizontal by 768 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this open cell can display 16.7M colors. The TFT-LCD panel used for this open cell is adapted for a low reflection and higher color type.



### 1.2 Features

- LVDS interface with 1 pixel / clock
- High-speed response
- Low color shift image quality
- 8-bit color depth, display 16.7M colors
- High luminance and contrast ratio, low reflection and wide viewing angle
- DE (Data Enable) only mode
- ADS technology is applied for high display quality
- RoHS compliant

|                              |                                                               |                 |
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|  京东方<br>BOE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | PRODUCT GROUP                                                 | REV    | ISSUE DATE                   |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------|------------------------------|-----------|---------------|------|--------|-------------|------------------------|----|--|------------------|------------------|--------|--|-------------|---------------------------|----|--|-------------------|----------------------------|--|--|----------------|-------------------|--------|--|--------------|-----------------------------------|--|--|-------------------------|-----------|---|------------------------------|--------|-------------|------|--|-------------------|-----------------------|------|--|-------------------|------------------------------------------------------|--|--|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | TFT LCD                                                       | P0.2   | 2012.05.10                   |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
| <h3>1.3 Application</h3> <ul style="list-style-type: none"><li>● Home Alone Multimedia TFT-LCD TV</li><li>● Display Terminals for Control System</li><li>● High Definition TV(HD TV)</li><li>● AV application Products</li></ul> <h3>1.4 General Specification</h3> <p>&lt; Table 1. General Specifications &gt;</p> <table><tr><th>Parameter</th><th>Specification</th><th>Unit</th><th>Remark</th></tr><tr><td>Active area</td><td>808.13(H) × 454.35 (V)</td><td>mm</td><td></td></tr><tr><td>Number of pixels</td><td>1366(H) × 768(V)</td><td>pixels</td><td></td></tr><tr><td>Pixel pitch</td><td>197.2(H) × RGB × 591.6(V)</td><td>μm</td><td></td></tr><tr><td>Pixel arrangement</td><td>Pixels RGB Vertical stripe</td><td></td><td></td></tr><tr><td>Display colors</td><td>16.7M(8bits-true)</td><td>colors</td><td></td></tr><tr><td>Display mode</td><td>Transmission mode, Normally Black</td><td></td><td></td></tr><tr><td>Open Cell Transmittance</td><td>6.7(typ.)</td><td>%</td><td>At center point with BOE BLU</td></tr><tr><td>Weight</td><td>1560 (typ.)</td><td>gram</td><td></td></tr><tr><td>Power Consumption</td><td>Total=6.5 Watt (Typ.)</td><td>Watt</td><td></td></tr><tr><td>Surface Treatment</td><td>Haze 10%, 3H, Semi-glare treatment (Front Polarizer)</td><td></td><td></td></tr></table> |                                                               |        |                              | Parameter | Specification | Unit | Remark | Active area | 808.13(H) × 454.35 (V) | mm |  | Number of pixels | 1366(H) × 768(V) | pixels |  | Pixel pitch | 197.2(H) × RGB × 591.6(V) | μm |  | Pixel arrangement | Pixels RGB Vertical stripe |  |  | Display colors | 16.7M(8bits-true) | colors |  | Display mode | Transmission mode, Normally Black |  |  | Open Cell Transmittance | 6.7(typ.) | % | At center point with BOE BLU | Weight | 1560 (typ.) | gram |  | Power Consumption | Total=6.5 Watt (Typ.) | Watt |  | Surface Treatment | Haze 10%, 3H, Semi-glare treatment (Front Polarizer) |  |  |
| Parameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Specification                                                 | Unit   | Remark                       |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
| Active area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 808.13(H) × 454.35 (V)                                        | mm     |                              |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
| Number of pixels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1366(H) × 768(V)                                              | pixels |                              |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
| Pixel pitch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 197.2(H) × RGB × 591.6(V)                                     | μm     |                              |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
| Pixel arrangement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Pixels RGB Vertical stripe                                    |        |                              |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
| Display colors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 16.7M(8bits-true)                                             | colors |                              |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
| Display mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Transmission mode, Normally Black                             |        |                              |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
| Open Cell Transmittance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 6.7(typ.)                                                     | %      | At center point with BOE BLU |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
| Weight                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1560 (typ.)                                                   | gram   |                              |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
| Power Consumption                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Total=6.5 Watt (Typ.)                                         | Watt   |                              |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
| Surface Treatment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Haze 10%, 3H, Semi-glare treatment (Front Polarizer)          |        |                              |           |               |      |        |             |                        |    |  |                  |                  |        |  |             |                           |    |  |                   |                            |  |  |                |                   |        |  |              |                                   |  |  |                         |           |   |                              |        |             |      |  |                   |                       |      |  |                   |                                                      |  |  |
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## 2.0 ABSOLUTE MAXIMUM RATINGS

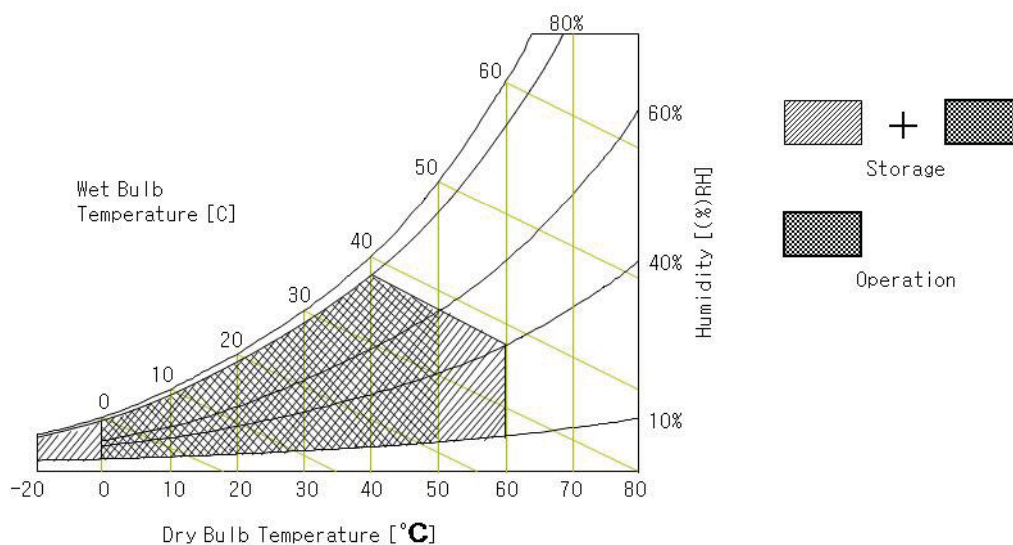
The followings are maximum values which, if exceed, may cause faulty operation or damage to the unit. The operational and non-operational maximum voltage and current values are listed in Table 2.

< Table 2. LCD Open Cell Electrical Specifications > [VSS=GND=0V]

| Parameter                  |               | Symbol           | Min.    | Max. | Unit | Remark     |
|----------------------------|---------------|------------------|---------|------|------|------------|
| Power Supply Voltage       | LCD Open Cell | VDD              | VSS-0.3 | 13.2 | V    | Ta = 25 °C |
|                            | Converter     | VBL              | VSS-0.3 | 26.4 | V    |            |
| Operating Temperature      |               | T <sub>OP</sub>  | 0       | +50  | °C   | Note 1     |
|                            |               | T <sub>SUR</sub> | 0       | +60  | °C   |            |
| Storage Temperature        |               | T <sub>ST</sub>  | -20     | +60  | °C   |            |
| Operating Ambient Humidity |               | Hop              | 10      | 80   | %RH  |            |
| Storage Humidity           |               | Hst              | 10      | 80   | %RH  |            |

Note 1 : Temperature and relative humidity range are shown in the figure below.

Wet bulb temperature should be 39 °C max. and no condensation of water.



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## 3.0 ELECTRICAL SPECIFICATIONS

## 3.1 TFT LCD Open Cell

&lt; Table 3. LCD Open Cell Electrical Specifications &gt;

[Ta =25±2 ℃]

| Parameter                   |                                           | Symbol | Values |     |      | Unit | Remark |
|-----------------------------|-------------------------------------------|--------|--------|-----|------|------|--------|
|                             |                                           |        | Min    | Typ | Max  |      |        |
| Power Supply Input Voltage  |                                           | VDD    | 10.8   | 12  | 13.2 | Vdc  |        |
| Power Supply Ripple Voltage |                                           | VRP    |        |     | 300  | mV   |        |
| Power Supply Current        |                                           | IDD    | -      | 525 | 625  | mA   | Note 1 |
| Power Consumption           |                                           | PDD    |        | 6.5 | 7.5  | Watt |        |
| Rush current                |                                           | IRUSH  | -      | -   | 3.0  | A    | Note 2 |
| LVDS Interface              | Differential Input High Threshold Voltage | VLVTH  | +100   |     | +300 | mV   |        |
|                             | Differential Input Low Threshold Voltage  | VLVTL  | -300   |     | -100 | mV   |        |
|                             | Common Input Voltage                      | VLVC   | 1.0    | 1.2 | 1.4  | V    |        |
| CMOS Interface              | Input High Threshold Voltage              | VIH    | 2.7    | -   | 3.3  | V    |        |
|                             | Input Low Threshold Voltage               | VIL    | 0      | -   | 0.6  | V    |        |

Note 1 : The supply voltage is measured and specified at the interface connector of LCM.

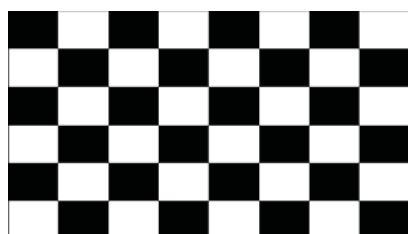
The current draw and power consumption specified is for VDD=12.0V,

Frame rate  $f_v=60\text{Hz}$  and Clock frequency = 75.4MHz.

Test Pattern of power supply current

a) Typ : Mosaic 8 x 6 Pattern(L0/L255)

Pattern(L0/L255)



b) Max : Skip 1H2V Sub Dot



Note 2 : The duration of rush current is about 2ms and rising time of Power Input is 1ms(min)

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## 4.0 INTERFACE CONNECTION

### 4.1 Open Cell Input Signal & Power

- Connector : IS100-L30B-C23(Manufactured by UJU) or Equivalent.

< Table 5. LCM Open Cell Input Connector Pin Configuration >

| Pin No | Symbol   | Description                    | Pin No | Symbol | Description                                 |
|--------|----------|--------------------------------|--------|--------|---------------------------------------------|
| 1      | VDD      | Power Supply +12.0V            | 16     | RX1+   | LVDS Receiver Signal(+)                     |
| 2      | VDD      | Power Supply +12.0V            | 17     | GND    | Ground                                      |
| 3      | VDD      | Power Supply +12.0V            | 18     | RX2-   | LVDS Receiver Signal(-)                     |
| 4      | VDD      | Power Supply +12.0V            | 19     | RX2+   | LVDS Receiver Signal(+)                     |
| 5      | GND      | Ground                         | 20     | GND    | Ground                                      |
| 6      | GND      | Ground                         | 21     | RCLK-  | LVDS Receiver Clock Signal(-)               |
| 7      | GND      | Ground                         | 22     | RCLK+  | LVDS Receiver Clock Signal(+)               |
| 8      | GND      | Ground                         | 23     | GND    | Ground                                      |
| 9      | LVDS_SEL | 'H' = JEIDA , 'L' or NC = VESA | 24     | RX3-   | LVDS Receiver Signal(-)                     |
| 10     | NC       | No Connection                  | 25     | RX3+   | LVDS Receiver Signal(+)                     |
| 11     | GND      | Ground                         | 26     | GND    | Ground                                      |
| 12     | RX0-     | LVDS Receiver Signal(-)        | 27     | BIST   | 'L' or NC=Free run mode ,<br>'H'= BIST mode |
| 13     | RX0+     | LVDS Receiver Signal(+)        | 28     | NC     | No Connection                               |
| 14     | GND      | Ground                         | 29     | NC     | No Connection                               |
| 15     | RX1-     | LVDS Receiver Signal(-)        | 30     | GND    | Ground                                      |

Notes : 1. NC(Not Connected) : This pins are only used for BOE internal operations.

2. Input Level of LVDS signal is based on the IEA 664 Standard.

3. LVDS\_SEL : This pin is used for selecting LVDS signal data format.

If this Pin : Low (GND) or Open (NC) → Normal NS LVDS format

Otherwise : High (3.3V) → JEIDA LVDS format

4. BIST : This pin is used for selecting display pattern mode when input DE or input CLOCK quits toggling.

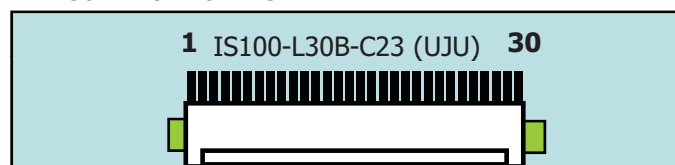
If this Pin : Low (GND) or Open (NC) → Free run mode(Black Pattern)

Otherwise : High( 3.3V) → BIST mode(BIST Pattern)

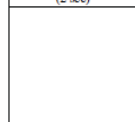
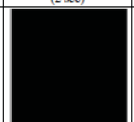
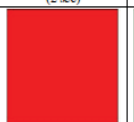
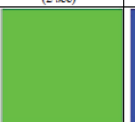
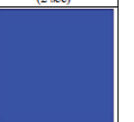
Sequence : On = VDD ≥ LVDS Option , BIST Option ≥ Interface signal

Off = Interface signal ≥ LVDS Option , BIST Option ≥ VDD

#### Rear view of LCM



#### BIST Pattern

|                                                                                     |                                                                                      |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| PT1: White<br>(2 sec)                                                               | PT2: Black<br>(2 sec)                                                                | PT3: Red<br>(2 sec)                                                                   | PT4: Green<br>(2 sec)                                                                 | PT5: Blue<br>(2 sec)                                                                  |
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4.2 LVDS Interface

- LVDS Receiver : Timing Controller (LVDS Rx merged) / LVDS Data : Pixel Data

< Table 6. LCM Open Cell Input Connector Pin Configuration >

|             | LVDS Pin     | Vesa Data format | JEIDA Data format | Remark |
|-------------|--------------|------------------|-------------------|--------|
| TxOUT/RxIN0 | TxIN/RxOUT0  | Red0 [LSB]       | R2                |        |
|             | TxIN/RxOUT1  | Red1             | R3                |        |
|             | TxIN/RxOUT2  | Red2             | R4                |        |
|             | TxIN/RxOUT3  | Red3             | R5                |        |
|             | TxIN/RxOUT4  | Red4             | R6                |        |
|             | TxIN/RxOUT6  | Red5             | R7 [MSB]          |        |
|             | TxIN/RxOUT7  | Green0 [LSB]     | G2                |        |
| TxOUT/RxIN1 | TxIN/RxOUT8  | Green1           | G3                |        |
|             | TxIN/RxOUT9  | Green2           | G4                |        |
|             | TxIN/RxOUT12 | Green3           | G5                |        |
|             | TxIN/RxOUT13 | Green4           | G6                |        |
|             | TxIN/RxOUT14 | Green5           | G7 [MSB]          |        |
|             | TxIN/RxOUT15 | Blue0 [LSB]      | B2                |        |
|             | TxIN/RxOUT18 | Blue1            | B3                |        |
| TxOUT/RxIN2 | TxIN/RxOUT19 | Blue2            | B4                |        |
|             | TxIN/RxOUT20 | Blue3            | B5                |        |
|             | TxIN/RxOUT21 | Blue4            | B6                |        |
|             | TxIN/RxOUT22 | Blue5            | B7 [MSB]          |        |
|             | TxIN/RxOUT24 | HSYNC            | HSYNC             |        |
|             | TxIN/RxOUT25 | VSYNC            | VSYNC             |        |
|             | TxIN/RxOUT26 | DEN              | DEN               |        |
| TxOUT/RxIN3 | TxIN/RxOUT27 | Red6             | R0 [LSB]          |        |
|             | TxIN/RxOUT5  | Red7 [MSB]       | R1                |        |
|             | TxIN/RxOUT10 | Green6           | G0 [LSB]          |        |
|             | TxIN/RxOUT11 | Green7 [MSB]     | G1                |        |
|             | TxIN/RxOUT16 | Blue6            | B0 [LSB]          |        |
|             | TxIN/RxOUT17 | Blue7 [MSB]      | B1                |        |
|             | TxIN/RxOUT23 | Reserved         | Reserved          |        |

|                              |                                                               |                 |
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## 5.0 SIGNAL TIMING SPECIFICATION

### 5.1 Timing Parameters (DE only mode)

< Table 8. Timing Table >

| ITEM                           | Symbol    |           | Min  | Typ  | Max  | Unit      | Note |
|--------------------------------|-----------|-----------|------|------|------|-----------|------|
| CLK                            | Period    | $t_{CLK}$ | 11.8 | 13.3 | 17.9 | ns        |      |
|                                | Frequency | -         | 56   | 75.4 | 85.0 | MHz       |      |
| Hsync                          | Period    | $t_{HP}$  | 1450 | 1560 | 2000 | $t_{CLK}$ |      |
|                                | Frequency | $f_H$     | 39.4 | 48.4 | 55   | KHz       |      |
| Vsync                          | Period    | $t_{VP}$  | 778  | 806  | 1200 | $t_{HP}$  |      |
|                                | Frequency | $f_V$     | 47   | 60   | 65   | Hz        |      |
| Horizontal Active Display Term | Valid     | $t_{HV}$  | -    | 1366 | -    | $t_{CLK}$ |      |
|                                | Total     | $t_{HP}$  | 1450 | 1560 | 2000 | $t_{CLK}$ |      |
| Vertical Active Display Term   | Valid     | $t_{VV}$  | -    | 768  | -    | $t_{HP}$  |      |
|                                | Total     | $t_{VP}$  | 778  | 806  | 1200 | $t_{HP}$  |      |

Notes: This product is DE only mode. The input of Hsync & Vsync signal does not have an effect on normal operation.

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### TFT LCD

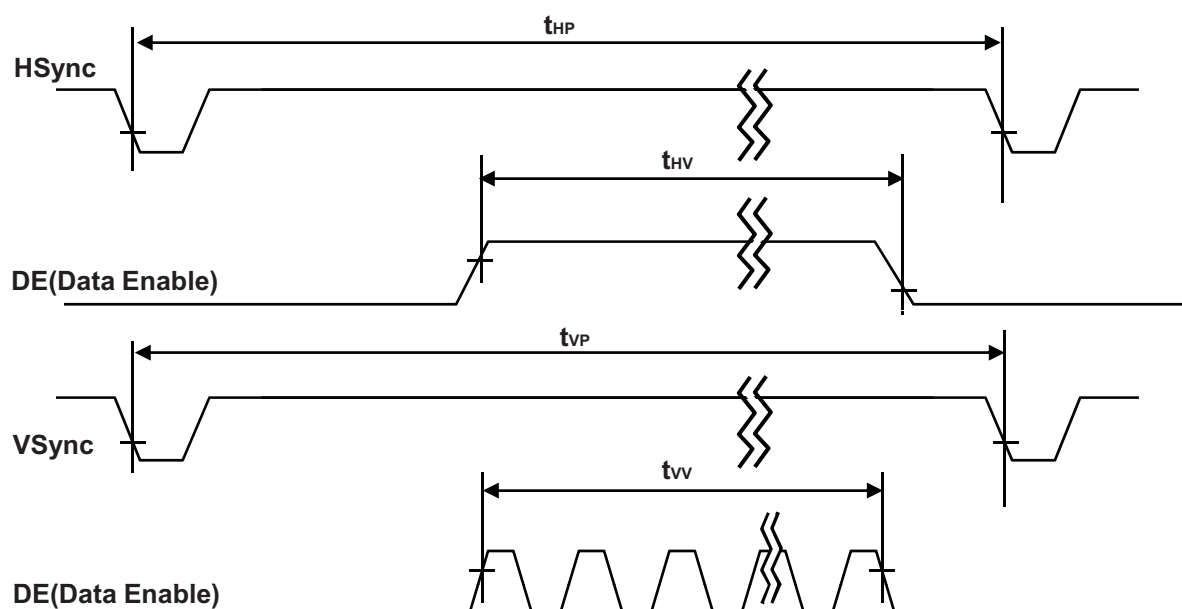
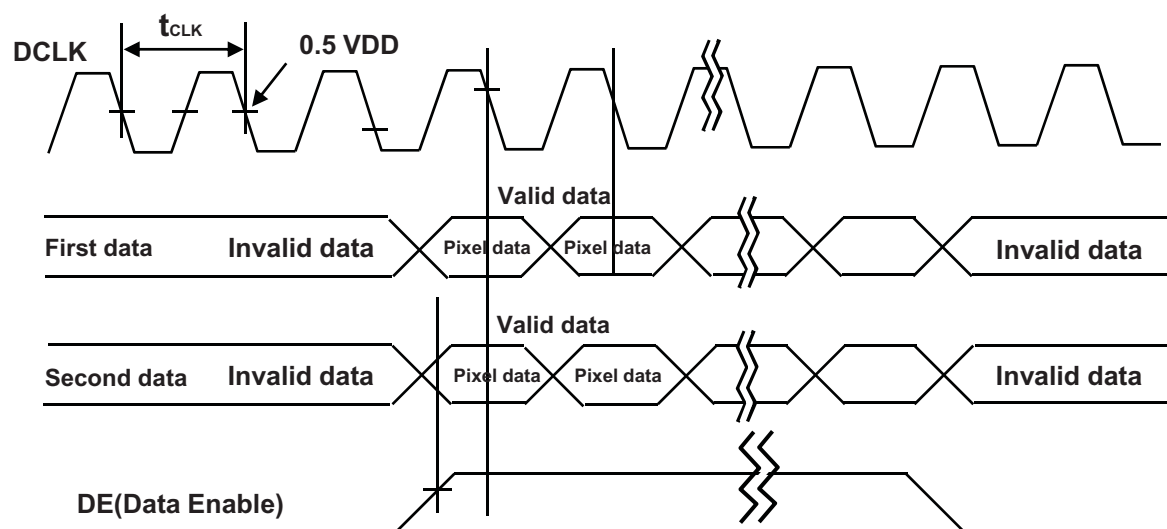
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## 5.2 Signal Timing Waveform



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### 5.3 Input Signals, Basic Display Colors and Gray Scale of Colors

< Table 9. Input Signal and Display Color Table >

| Color & Gray Scale  |          | Input Data Signal |    |    |    |    |    |    |    |            |    |    |    |    |    |    |    |           |    |    |    |    |    |    |    |
|---------------------|----------|-------------------|----|----|----|----|----|----|----|------------|----|----|----|----|----|----|----|-----------|----|----|----|----|----|----|----|
|                     |          | Red Data          |    |    |    |    |    |    |    | Green Data |    |    |    |    |    |    |    | Blue Data |    |    |    |    |    |    |    |
|                     |          | R7                | R6 | R5 | R4 | R3 | R2 | R1 | R0 | G7         | G6 | G5 | G4 | G3 | G2 | G1 | G0 | B7        | B6 | B5 | B4 | B3 | B2 | B1 | B0 |
| Basic Colors        | Black    | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Blue     | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1         | 1  | 1  | 1  | 1  | 1  | 1  | 1  |
|                     | Green    | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1          | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Cyan     | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1          | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1         | 1  | 1  | 1  | 1  | 1  | 1  | 1  |
|                     | Red      | 1                 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Magenta  | 1                 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1         | 1  | 1  | 1  | 1  | 1  | 1  | 1  |
|                     | Yellow   | 1                 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1          | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | White    | 1                 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1          | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1         | 1  | 1  | 1  | 1  | 1  | 1  | 1  |
| Gray Scale of Red   | Black    | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | △        | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Darker   | 0                 | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | △        | ↑                 |    |    |    |    |    |    |    | ↑          |    |    |    |    |    |    |    | ↑         |    |    |    |    |    |    |    |
|                     | ▽        | ↓                 |    |    |    |    |    |    |    | ↓          |    |    |    |    |    |    |    | ↓         |    |    |    |    |    |    |    |
|                     | Brighter | 1                 | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | ▽        | 1                 | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Red      | 1                 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Gray Scale of Green | Black    | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | △        | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Darker   | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | △        | ↑                 |    |    |    |    |    |    |    | ↑          |    |    |    |    |    |    |    | ↑         |    |    |    |    |    |    |    |
|                     | ▽        | ↓                 |    |    |    |    |    |    |    | ↓          |    |    |    |    |    |    |    | ↓         |    |    |    |    |    |    |    |
|                     | Brighter | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1          | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | ▽        | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1          | 1  | 1  | 1  | 1  | 1  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | Green    | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1          | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
| Gray Scale of Blue  | Black    | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | △        | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 1  |
|                     | Darker   | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 1  | 0  |
|                     | △        | ↑                 |    |    |    |    |    |    |    | ↑          |    |    |    |    |    |    |    | ↑         |    |    |    |    |    |    |    |
|                     | ▽        | ↓                 |    |    |    |    |    |    |    | ↓          |    |    |    |    |    |    |    | ↓         |    |    |    |    |    |    |    |
|                     | Brighter | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1         | 1  | 1  | 1  | 1  | 1  | 0  | 1  |
|                     | ▽        | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1         | 1  | 1  | 1  | 1  | 1  | 1  | 0  |
|                     | Blue     | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 1         | 1  | 1  | 1  | 1  | 1  | 1  | 1  |
| Gray Scale of White | Black    | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 0  |
|                     | △        | 0                 | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0          | 0  | 0  | 0  | 0  | 0  | 0  | 1  | 0         | 0  | 0  | 0  | 0  | 0  | 0  | 1  |
|                     | Darker   | 0                 | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0          | 0  | 0  | 0  | 0  | 0  | 1  | 0  | 0         | 0  | 0  | 0  | 0  | 0  | 1  | 0  |
|                     | △        | ↑                 |    |    |    |    |    |    |    | ↑          |    |    |    |    |    |    |    | ↑         |    |    |    |    |    |    |    |
|                     | ▽        | ↓                 |    |    |    |    |    |    |    | ↓          |    |    |    |    |    |    |    | ↓         |    |    |    |    |    |    |    |
|                     | Brighter | 1                 | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1          | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1         | 1  | 1  | 1  | 1  | 1  | 0  | 1  |
|                     | ▽        | 1                 | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1          | 1  | 1  | 1  | 1  | 1  | 0  | 1  | 1         | 1  | 1  | 1  | 1  | 1  | 1  | 0  |
|                     | White    | 1                 | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1          | 1  | 1  | 1  | 1  | 1  | 1  | 1  | 1         | 1  | 1  | 1  | 1  | 1  | 1  | 1  |

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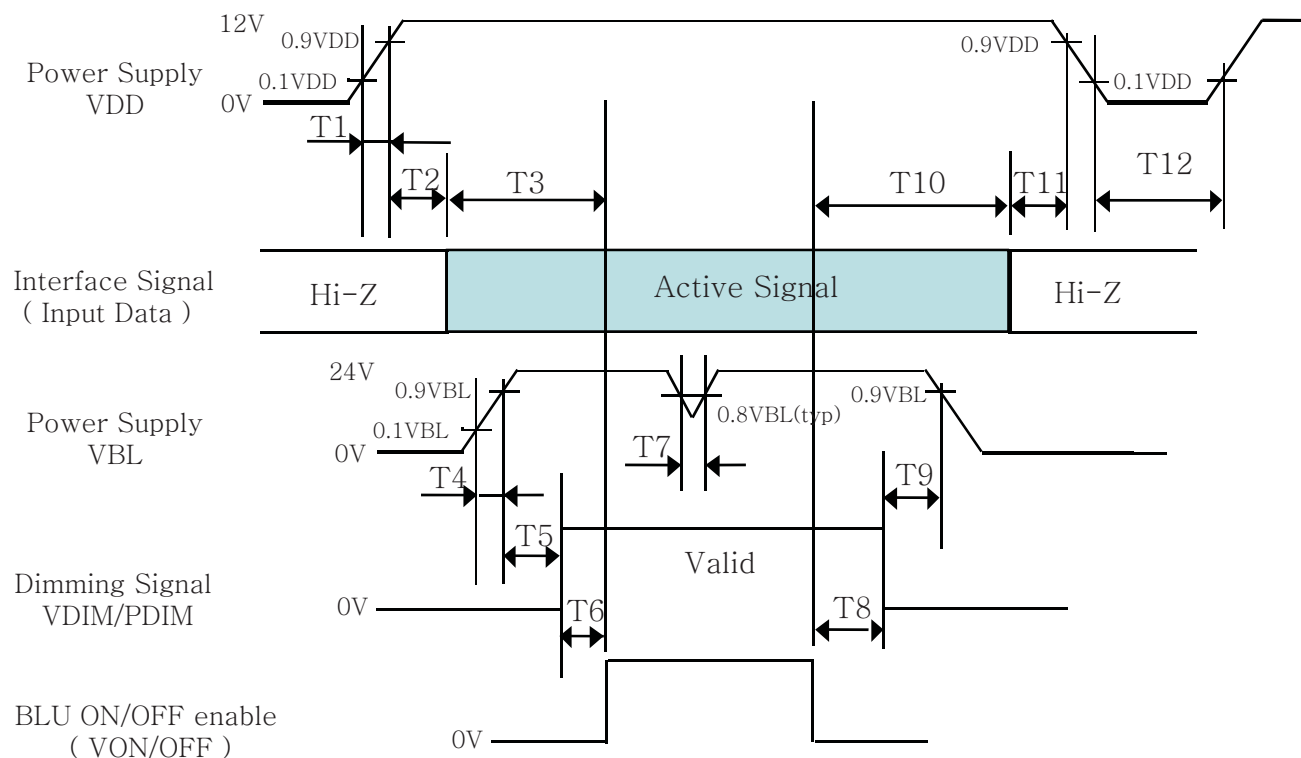
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## 5.4 Power Sequence



< Table 10. Sequence Table >

| Parameter | Values |     |     | Units |
|-----------|--------|-----|-----|-------|
|           | Min    | Typ | Max |       |
| T1        | 0.5    | -   | 20  | ms    |
| T2        | 0      | -   | 50  | ms    |
| T3        | 200    | -   | -   | ms    |
| T4        | 20     | -   | -   | ms    |
| T5        | 500    | -   | -   | ms    |
| T6        | 0      | -   | -   | ms    |
| T7        | -      | -   | 10  | ms    |
| T8        | 0      | -   | -   | ms    |
| T9        | 10     | -   | -   | ms    |
| T10       | 200    | -   | -   | ms    |
| T11       | 0      | -   | 50  | ms    |
| T12       | 1      | -   | -   | s     |

- Notes: 1. Even though T1 is over the specified value, there is no problem if I2T spec of fuse is satisfied.  
 2. Even though T4 is over the specified value, there is no problem if I2T spec of fuse is satisfied.  
 3. Back Light must be turn on after power for logic and interface signal are valid.

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## 6.0 OPTICAL SPECIFICATIONS

The test of optical specifications shall be measured in a dark room (ambient luminance $\leq$ 1 lux and temperature= $25\pm 2^{\circ}\text{C}$ ) with the equipment of Luminance meter system (Goniometer system and PR730) and test unit shall be located at an approximate distance 50cm from the LCD surface at a viewing angle of  $\theta$  and  $\Phi$  equal to  $0^{\circ}$ . We refer to  $\theta_{\Phi=0}$  ( $=\theta_3$ ) as the 3 o'clock direction (the "right"),  $\theta_{\Phi=90}$  ( $=\theta_{12}$ ) as the 12 o'clock direction ("upward"),  $\theta_{\Phi=180}$  ( $=\theta_9$ ) as the 9 o'clock direction ("left") and  $\theta_{\Phi=270}$  ( $=\theta_6$ ) as the 6 o'clock direction ("bottom"). While scanning  $\theta$  and/or  $\Phi$ , the center of the measuring spot on the Display surface shall stay fixed. The measurement shall be executed after 30 minutes warm-up period. VDD shall be 12.0V  $\pm$ 10% at  $25^{\circ}\text{C}$ . Optimum viewing angle direction is 6 'clock.

< Table 11. Optical Table >

[VDD = 12.0V, Frame rate = 60Hz, Ta = $25\pm 2^{\circ}\text{C}$ ]

| Parameter      |            | Symbol         | Condition                              | Min   | Typ    | Max | Unit | Remark |
|----------------|------------|----------------|----------------------------------------|-------|--------|-----|------|--------|
| Viewing Angle  | Horizontal | $\Theta_3$     | CR > 10                                |       | 89     |     | Deg. | Note 1 |
|                |            | $\Theta_9$     |                                        |       | 89     |     | Deg. |        |
|                | Vertical   | $\Theta_{12}$  |                                        |       | 89     |     | Deg. |        |
|                |            | $\Theta_6$     |                                        |       | 89     |     | Deg. |        |
| Contrast ratio |            | CR             | $\Theta = 0^\circ$                     | 900:1 | 1200:1 | -   |      | Note 2 |
| Response Time  | G to G     | T <sub>g</sub> | (Center)<br>Normal<br>Viewing<br>Angle | -     | 8      | 10  | ms   | Note 6 |
| Gamma Scale    |            |                |                                        | 2.0   | 2.2    | 2.4 |      |        |

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Note :

1. Viewing angle is the angle at which the contrast ratio is greater than 10. The viewing are determined for the horizontal or 3, 9 o'clock direction and the vertical or 6, 12 o'clock direction with respect to the optical axis which is normal to the LCD surface.
2. Contrast measurements shall be made at viewing angle of  $\theta = 0^\circ$  and at the center of the LCD surface. Luminance shall be measured with all pixels in the view field set first to white, then to the dark (black) state. (See Figure 1 shown in Appendix) Luminance Contrast Ratio (CR) is defined mathematically.

$$CR = \frac{\text{Luminance when displaying a white raster}}{\text{Luminance when displaying a black raster}}$$

3. Center Luminance of white is defined as the LCD surface. Luminance shall be measured with all pixels in the view field set first to white. This measurement shall be taken at the locations shown in Figure 2 for a total of the measurements per display.
4. The White luminance uniformity on LCD surface is then expressed as :  
 $\Delta Y = (\text{Minimum Luminance of 5points} / \text{Maximum Luminance of 5points}) * 100$   
 (See Figure 2 shown in Appendix).
5. The color chromaticity coordinates specified in Table 11. shall be calculated from the spectral data measured with all pixels first in red, green, blue and white. Measurements shall be made at the center of the panel.
6. Response time  $T_g$  is the average time required for display transition by switching the input signal as below table and is based on Frame rate  $f_V = 60\text{Hz}$  to optimize.  
 Each time in below table is defined as Figure 3 and shall be measured by switching the

| Measured Response Time | Target |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|------------------------|--------|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                        | 0      | 15 | 31 | 47 | 63 | 79 | 95 | 111 | 127 | 143 | 159 | 175 | 191 | 207 | 223 | 239 |
| Start                  | 0      |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 15     |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 31     |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 47     |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 63     |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 79     |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 95     |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 111    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 127    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 143    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 159    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 175    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 191    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 207    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 223    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 239    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |
|                        | 255    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |

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## 7.0 MECHANICAL CHARACTERISTICS

### 7.1 Dimensional Requirements

Figure 3 (located in Appendix) shows mechanical outlines for the model HV365WX2-200. Other parameters are shown in Table 10.

< Table 10. Dimensional Parameters >

| Parameter        | Specification                               | Unit   |
|------------------|---------------------------------------------|--------|
| Active area      | 808.13(H) × 454.35 (V)                      | mm     |
| Pixel pitch      | 197.2(H) × RGB × 591.6(V)                   | um     |
| Number of pixels | 1366(H) × 768(V) (1 pixel = R + G + B dots) | pixels |
| Weight           | 1560 (typ.)                                 | gram   |

### 7.2 Semi-Glare and Polarizer Hardness

The surface of the LCD has an semi-glare coating to minimize reflection and a coating to reduce scratching.

|                              |                                                               |                  |
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## 8.0 RELIABILITY TEST

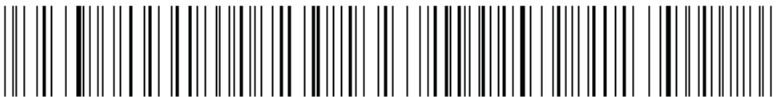
The Reliability test items and its conditions are shown in below.

< Table 13. Reliability Test Parameters >

| No | Test Items                                      | Conditions                                                                                                          |
|----|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| 1  | High temperature storage test                   | Ta = 60 °C , 240 hrs                                                                                                |
| 2  | Low temperature storage test                    | Ta = -20 °C , 240 hrs                                                                                               |
| 3  | High temperature & high humidity operation test | Ta = 50 °C , 80%RH, 240hrs                                                                                          |
| 4  | High temperature operation test                 | Ta = 50 °C , 240hrs                                                                                                 |
| 5  | Low temperature operation test                  | Ta = 0 °C , 240hrs                                                                                                  |
| 6  | Thermal shock                                   | Ta = -20 °C ↔ 60 °C (0.5 hr), 100 cycle                                                                             |
| 7  | Vibration test<br>(non-operating)               | Frequency : 10 ~ 300 Hz,<br><br>Gravity / AMP : 1.0 Grms<br><br>Period : X, Y, Z 30 min                             |
| 8  | Shock test<br>(non-operating)                   | Gravity : 50G<br><br>Pulse width : 11msec, Half Sine wave<br><br>±X, ±Y, ±Z Once for each direction                 |
| 9  | Electro-static discharge test                   | Air :<br>±15kV , 150pF/330Ω , 100Point , 1time/Point<br><br>Contact :<br>±8kV , 150pF/330Ω , 100Point , 1time/Point |

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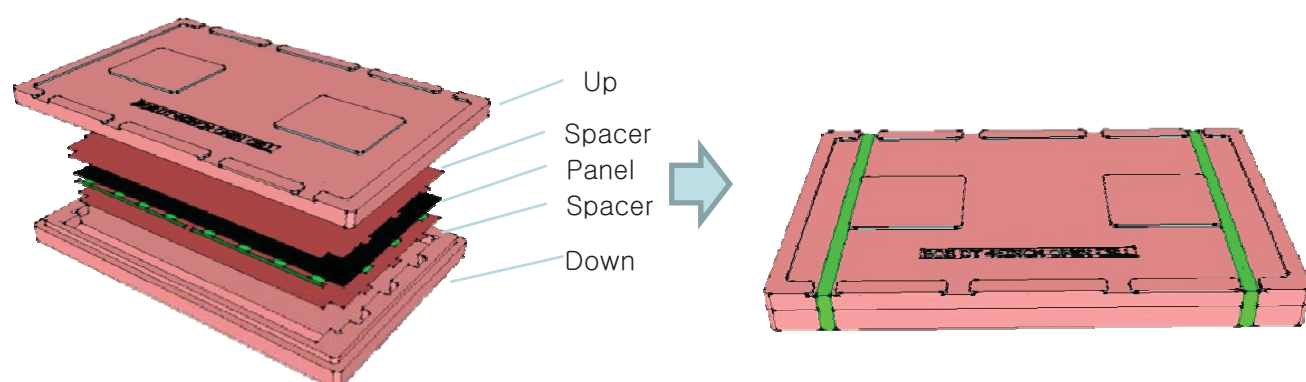
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                               |              |                           |              |                                                     |                                                                               |   |   |   |   |                           |              |              |                           |              |                                                     |                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------|---------------------------|--------------|-----------------------------------------------------|-------------------------------------------------------------------------------|---|---|---|---|---------------------------|--------------|--------------|---------------------------|--------------|-----------------------------------------------------|-------------------------------------------------------------------------------|
|  京东方<br>BOE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PRODUCT GROUP                                                 | REV          | ISSUE DATE                |              |                                                     |                                                                               |   |   |   |   |                           |              |              |                           |              |                                                     |                                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | TFT LCD                                                       | P0.2         | 2012.05.10                |              |                                                     |                                                                               |   |   |   |   |                           |              |              |                           |              |                                                     |                                                                               |
| <b>8.0 PRODCUT SERIAL NUMBER</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                               |              |                           |              |                                                     |                                                                               |   |   |   |   |                           |              |              |                           |              |                                                     |                                                                               |
| <div><div><br/>MADE IN CHINA</div><div>HV365WX2-200<br/><br/>XXXXXXXXXXXXXXXXXXXX<br/><br/>B4</div></div>                                                                                                                                                                                                                                                                                             |                                                               |              |                           |              |                                                     |                                                                               |   |   |   |   |                           |              |              |                           |              |                                                     |                                                                               |
| <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td><div>X</div><div>X</div></td><td><div>X</div></td><td><div>X</div></td><td><div>X</div><div>X</div></td><td><div>X</div></td><td><div>X</div><div>X</div><div>X</div><div>X</div></td><td><div>X</div><div>X</div><div>X</div><div>X</div><div>X</div><div>X</div></td></tr></table> <div><div><div>1. Control Number</div><div>2. Rank / Grade</div><div>3. Line Classification</div><div>4. Year (2011 : 11, 2012 : 12, ...)</div></div><div><div>5. Month (1,2,3, ... , 9, X, Y, Z)</div><div>6. Internal Use</div><div>7. Serial Number</div></div></div> |                                                               |              |                           | 1            | 2                                                   | 3                                                                             | 4 | 5 | 6 | 7 | <div>X</div> <div>X</div> | <div>X</div> | <div>X</div> | <div>X</div> <div>X</div> | <div>X</div> | <div>X</div> <div>X</div> <div>X</div> <div>X</div> | <div>X</div> <div>X</div> <div>X</div> <div>X</div> <div>X</div> <div>X</div> |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2                                                             | 3            | 4                         | 5            | 6                                                   | 7                                                                             |   |   |   |   |                           |              |              |                           |              |                                                     |                                                                               |
| <div>X</div> <div>X</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <div>X</div>                                                  | <div>X</div> | <div>X</div> <div>X</div> | <div>X</div> | <div>X</div> <div>X</div> <div>X</div> <div>X</div> | <div>X</div> <div>X</div> <div>X</div> <div>X</div> <div>X</div> <div>X</div> |   |   |   |   |                           |              |              |                           |              |                                                     |                                                                               |
| SPEC. NUMBER<br>S8-65-8A-014                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | SPEC. TITLE<br>HV365WX2-200 Preliminary Product Specification |              | PAGE<br>18 of 23          |              |                                                     |                                                                               |   |   |   |   |                           |              |              |                           |              |                                                     |                                                                               |

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|  京东方<br>BOE | PRODUCT GROUP | REV  | ISSUE DATE |
|                                                                                              | TFT LCD       | P0.2 | 2012.05.10 |

## 9.0 PACKING INFORMATION

BOE provides the standard shipping container for customers, unless customer specifies their packing information. The standard packing method and Barcode information are shown in below.

### 9.1 Packing Order



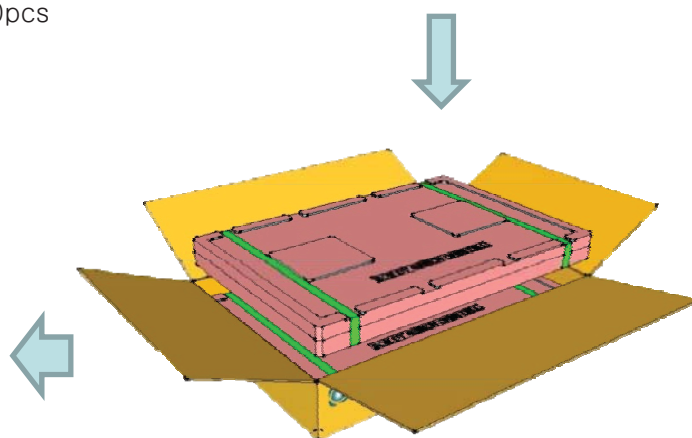
Stowage: Spacer + Panel + Spacer+...+Panel + Spacer

Total: Spacer: 11pcs, Panel: 10pcs

Dense box packing method



8 Inner Box/160Pcs/1 Pallet



2 Dense Box/1 Inner Box

Packing method

|                              |                                                               |                  |
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|  京东方<br>BOE | PRODUCT GROUP | REV  | ISSUE DATE |
|                                                                                              | TFT LCD       | P0.2 | 2012.05.10 |

## 9.2 Packing Note

- Box Dimension : 990mmL×625mmW×110mmH
- Package Quantity in one Box : 10pcs

## 9.3 Box Label

- Label Size : 108 mm (L) × 56 mm (W)
- Contents

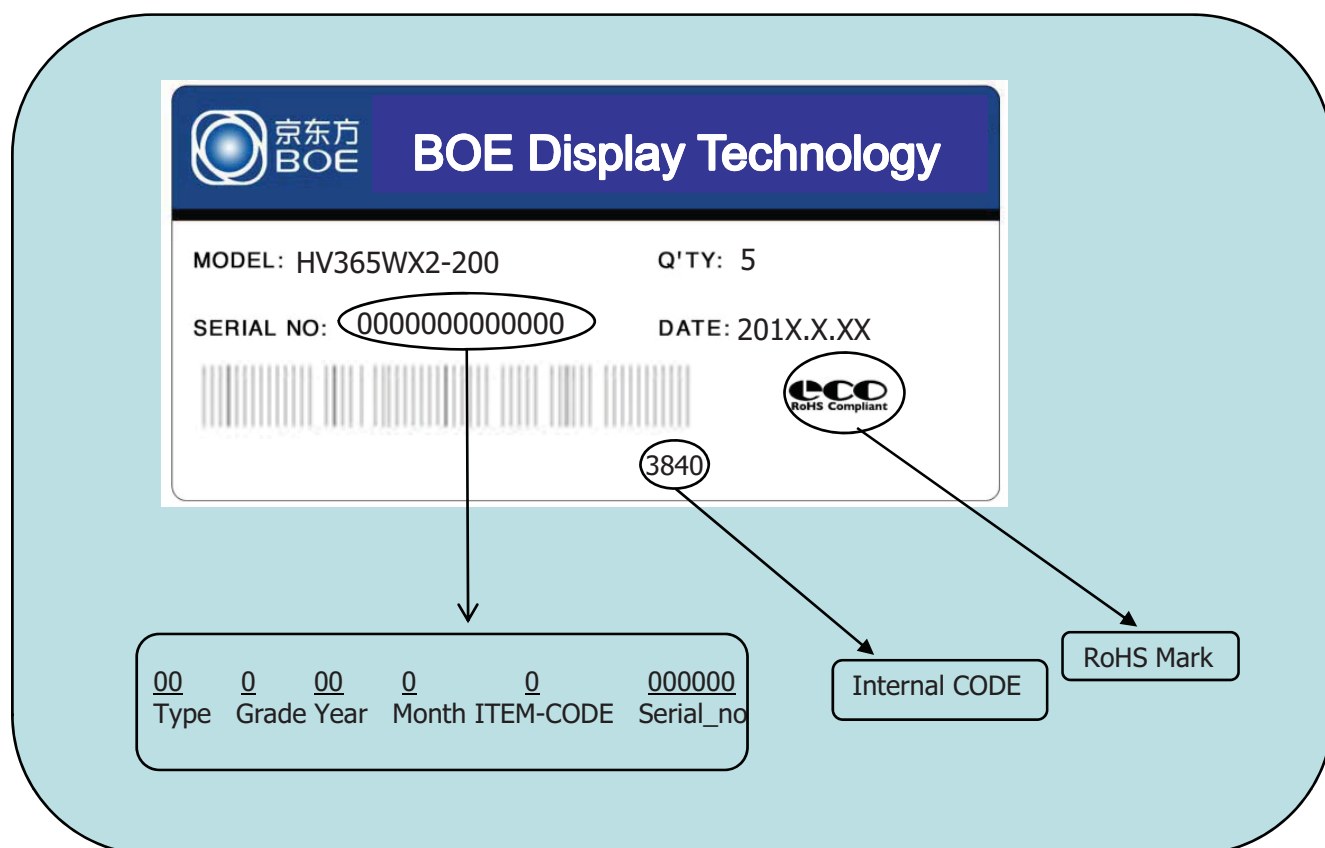
Model : HV365WX2-200

Q`ty : 10 Open Cell in one box.

Serial No. : Box Serial No. See next page for detail description.

Date : Packing Date

FG Code : FG Code of Product



|                              |                                                               |                  |
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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------|------------------|
|  京东方<br>BOE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | PRODUCT GROUP                                                 | REV  | ISSUE DATE       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | TFT LCD                                                       | P0.2 | 2012.05.10       |
| <b>11.0 HANDLING &amp; CAUTIONS</b><br><br><b>CAUTIONS</b><br>(1) Cautions when taking out the Panel<br>Pick the pouch only, when taking out panel from a shipping package.<br>(2) Cautions for handling the panel<br>As the electrostatic discharges may break the LCD Panel, handle the LCD panel with care. Peel a protection sheet off from the LCD panel surface as slowly as possible.<br>As the LCD panel and back -light element are made from fragile glass material, impulse and pressure to the LCD panel should be avoided.<br>As the surface of the polarizer is very soft and easily scratched, use a soft dry cloth without chemicals for cleaning.<br>Do not pull the interface connector in or out while the LCD panel is operating.<br>Put the panel display side down on a flat horizontal plane.<br>Handle connectors and cables with care.<br>(3) Cautions for the operation<br>When the panel is operating, do not lose CLK, ENAB signals. If any one of these signals is lost, the LCD panel would be damaged.<br>Obey the supply voltage sequence. If wrong sequence is applied, the panel would be damaged.<br>(4) Cautions for the atmosphere<br>Dew drop atmosphere should be avoided.<br>Do not store and/or operate the LCD panel in a high temperature and/or humidity atmosphere. Storage in an electro-conductive polymer packing pouch and under relatively low temperature atmosphere is recommended.<br>(5) Cautions for the panel characteristics<br>Do not apply fixed pattern data signal to the LCD panel at product aging.<br>Applying fixed pattern for a long time may cause image sticking.<br>(6) Other cautions<br>Do not disassemble and/or re-assemble LCD panel.<br>Do not re-adjust variable resistor or switch etc.<br>When returning the panel for repair or etc., Please pack the panel not to be broken. We recommend to use the original shipping packages. |                                                               |      |                  |
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**京东方**  
**BOE****PRODUCT GROUP****TFT LCD**

REV

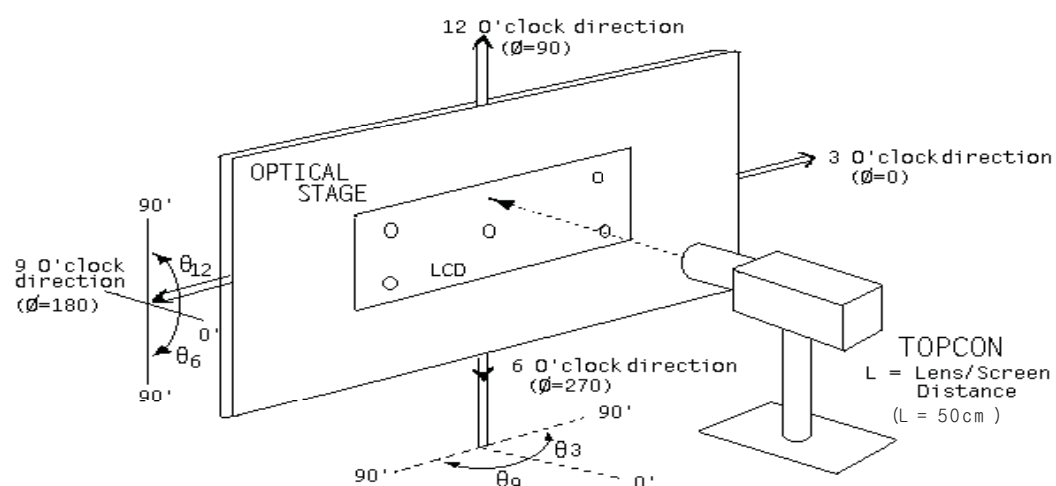
P0.2

ISSUE DATE

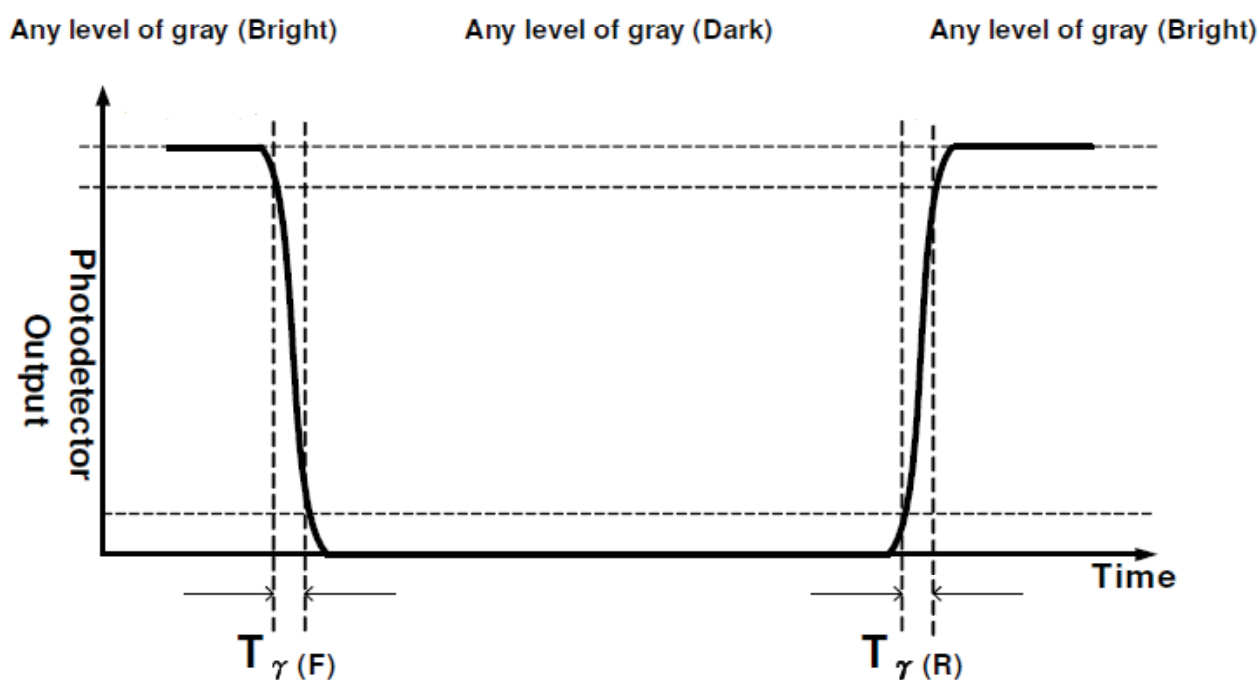
2012.05.10

**12.0 APPENDIX**

&lt; Figure 1. Measurement Set Up &gt;



&lt; Figure 2. Response Time Testing &gt;

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